This excellent work is Volume 1 of a treatise in the ceramic and silicate industries by the same author. The processes used are those used in the testing department of the County Pottery Laboratory, Staffordshire, for the analysis of clay, bricks, glazes, enamels, refractories, and for the coloring materials and minerals used in ceramics.

The book is divided into five parts with an historical introduction of ten pages.

Part I., containing 140 pages, takes up rather exhaustively the following chapters: I. Weighing, 25 pages; II. The Measurement of Volumes, 17 pages; III. Volumetric Analysis, 37 pages; IV. Colorimetry and Turbidinity, 5 pages; V. Filtration and Washing, 23 pages; VI. Heating and Drying, 10 pages; VII. Pulverization and Grinding, 7 pages; VIII. Sampling, 14 pages; IX. The Reagents, 11 pages.

Part II. containing 98 pages takes up carefully and in detail the analyses of clays and other silicates. The accuracy obtainable is illustrated by tables giving the results of actual analyses of silicates showing the variations to be expected for each determination. The methods used are practically those used by the U. S. Geological Survey somewhat shortened.

Part III., containing 121 pages, takes up the analysis of glass, glazes, enamels and colors, including the determination of arsenic, antimony, tin, lead, bismuth, mercury, copper, cachnium, zinc, manganese, cobalt and nickel.

Part IV., 128 pages, describes special methods for the determination of the following: molybdenum, tungsten, niobium, tantalum, gold, selenium, aluminum, beryllum, iron, chromium, vanadium, uranium, zirconium, thorium, the rare earths, barium, strontium, calcium, magnesium and the alkalies.

Part V., containing 111 pages, describes special methods for the acids and non-metals, carbon, boron, oxide, water, phosphorus, sulfur, the halogens, and the rational analysis of clays.

Finally the Appendix contains 55 pages of analytical tables, etc.

This work is just what its title indicates, "A Treatise on Quantitative Inorganic Analysis," written more especially with the needs of the ceramic chemist in view. It is profusely illustrated with photographs, drawings and graphs, and the bibliography given in the footnotes is quite complete.

The methods given are perhaps somewhat unnecessarily long for the technical chemist, but this is on the safe side and the chemist can shorten the methods to suit himself. Dr. Mellor has left out gas and fuel analyses on the ground that there are so many books specializing in these subjects.

The book is a very helpful addition to the library of the analytical chemist, particularly because it keeps in view always the analysis of the kind of things the chemist has actually to analyze and not merely pure salts. It will be invaluable to the ceramic chemist.

Dr. Mellor is to be congratulated on the completion of this work.

D. J. DEMOREST

THE COLLEGE CURRICULUM

PRESIDENT MEIKLEJOHN, of Amherst College, in his recent annual report, makes some interesting contributions to the discussion of the college curriculum. In the first place, he shows it to be an unfounded rumor that Amherst has become distinctly a "classical" school, to the neglect of the sciences. Dean Ferry's statistics of student registration, published last year in SCIENCE, give Amherst a median position among the New England colleges, both in science and in the classics, as well as in English and other modern languages, and a low position only in the "humanistic sciences," including history, economics and philosophy. It is true that Amherst has abandoned the B.S. degree, but this was done partly because that degree attracted a lower grade of students and was regarded as inferior to the Arts degree and easier to obtain, and partly for the purpose of simplifying the mechanism of a prescribed curriculum, to which policy Amherst is now committed. For the last few years, its curriculum has been largely prescribed and has demanded much concentration upon "majors." The plan has been found defective in one respect, since

the absence of the humanistic sciences from the freshman and sophomore years, along with the requirement of continuing courses, has operated to keep students out of these subjects. This defect has now been remedied by introducing philosophy into the sophomore year, and a course on "social and economic institutions" into the freshman year.

The curriculum now adopted is to be regarded as but a station on the road to a course almost wholly prescribed, and organized about one great central purpose, that, namely, of initiating the student into an understanding of human experience and the moral and intellectual problems of the times. President Meiklejohn offers a sketch of the ideal college course, as he sees it coming—merely a sketch, confessedly, which will need correction as the result of abundant discussion. The plan certainly is radical. Of the four-year course, 66 per cent. is prescribed, and half of the remainder must be devoted to the senior "major," which is itself to be a continuation of some junior study. The prescribed work is divided as follows: 15 per cent. (of the whole curriculum) to mathematics and natural science, 15 per cent. to literature and 36 per cent. to the humanistic sciences. In favor of this plan, there is this at least to be said, that it follows the trend of the times. While discussion has been raging over the relative values of natural science and the classics, the student body, where free, has attached itself to modern literature and especially to the humanistic sciences. At Harvard, according to Dean Ferry's figures, 3 per cent. of student registration goes to the ancient languages, 25 per cent. to mathematics and science, 28 per cent. to modern literatures and 44 per cent. to "other subjects"; and Professor Hervey has found almost exactly the same proportions among elective subjects in Columbia College. The emphasis on the "other subjects," in President Meiklejohn's plan, may thus be taken as meeting a demand voiced by the students. The question may indeed be raised whether it is worth while, by faculty legislation, to require all students to do what the majority do of their own choice. Another query is suggested by President Meiklejohn's objections to the elective system.

> Under the elective scheme, no subject is essential. Why study physics hard when other students are getting an education without it? . . . The argument is bad but none the less convincing.

Under a required curriculum, the difficulty may be to keep the student in ignorance of the fact that the requirements are different at other colleges. It may also be difficult to explain to him why he should specialize on some one subject to the extent of devoting most of his senior year to it, when his classmate is acquiring a liberal education, presumably just as good, without specialization in this particular direction. If the student is genuinely in love with his subject, well and good—or if he sees a vocational value in it; but vocational values, we are assured, are to be left entirely aside from the curriculum of a liberal college.

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SPECIAL ARTICLES

On Some Non-Specific Factors for the Entrance of the Spermatozoon into the Egg

1. While formerly fertilization was considered a single process which could be adequately described by the entrance of the spermatozoon into the egg or the fusion of the egg nucleus with the sperm nucleus, we know now, through the methods of experimental biology, that fertilization consists of at least three different groups of phenomena. These are, first, the transmission of paternal characters through the spermatozoon. This process is obviously a function of the chromosomes. Second, the causation of development of the egg, which is apparently independent of the chromosomes since the experiments on artificial parthenogenesis have shown that it can be induced by certain non specific agencies. The causation of development is a complicated process since it requires at least two agencies, one inducing an alteration of the surface of the egg (which sets the chemical processes underlying development in action), and the